water held in two museum jars. The leaves were illuminated 15 hr/day. After 11 days they were frozen and their asparagine was extracted as from the lupin seedlings described above. A duplicate experiment was run for 6 days. As indicated in Table 1, the asparagine from tobacco leaves had a much greater activity.

Longer periods of illumination were then tried with lupin seedlings. One hundred g of white lupin seeds were soaked, planted in flats in sand, and grown in a greenhouse. Eight-day-old seedlings were cut off at the ground level, and put in a desiccator with their stems immersed in 0.1% NH_4Cl. They were illuminated for 3 days, and their asparagine extracted. This experiment was repeated twice, using blue lupin seedlings illuminated for 6 days (Table 1).

It is apparent from Table 1 that by extending the time of contact with $C^{14}O_2$ the activity of the asparagine is considerably increased. It might be possible to increase it still further by raising the amounts of C^{14} in the air during the experiment. Since lupin seedlings could be utilized for such a synthesis within 8 days after germination, and since they yield larger amounts of radioactive asparagine than tobacco leaves, their use appears preferable.

References

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Comments and Communications

The Search for Truth

The New York State law referred to in your March 2 issue does not—as your headline claims—represent "A Return to Medievalism in Science Teaching." Rather, it gives the individual citizen protection against the growing tendency toward statism, with its enslavement of body and mind to the whims of the relatively few men whose aim is to force conformity to their own political, economic, or scientific views—however sincerely they may believe them to be in "the interests of society."

Who is to say what constitutes the "truth" claimed for "scientific laws . . . established beyond a doubt"? In every age there have been men who claimed privileged knowledge of "scientific truth" when, in very fact, their so-called knowledge was but the exposition of theories originated in their own minds to explain, to their greater satisfaction, certain physical or mental phenomena that were not wholly explained by previous beliefs. There is today no avenue of scientific investigation in which the intellectually honest scientist will assert that the theories on which current investigations are conducted have been "established beyond doubt." The most any such scientist will claim is that the currently accepted theories provide a more satisfactory working basis than was afforded by yesterday's theories. And the sincere scientist expects tomorrow to reveal new theories that will supersede those of today and bring man one step nearer a knowledge of incontrovertible truth.

In the light of scientific history, who can say that we have, today, an absolute knowledge of truth—and that the citizen who chooses, for religious or any other reasons, to question the desirability of accepting today's theories should be forced to relinquish his own sincerely held beliefs in favor of theories he has ample reason to believe will, tomorrow, be outmoded?

The very vehemence of the argument that the individual's exercise of his right to religious freedom may bring "a time when our scientific curricula will be demolished piecemeal" proves the weakness of this argument. As long as thinking men press their search for the ultimate truth, *theories* will be superseded, but our scientific curricula will become ever stronger and more valuable.

Any attempt to abrogate the right of the individual citizen to refuse acceptance of a scientific theory—whether it apply to biology, physics, geography, or whatever—is an expression of bigotry. And bigotry of any nature—scientific or religious—is intolerable to free men.

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Editorial Note: The following Introduction from a *Brief Urging the Repeal of Subdivision 5 of the (N. Y.) State Education Law, Section 3204, Chapter 135, August 1, 1950,* was prepared by The New York Association of Teachers of the Biological Sciences and The New York Association of Chairmen of the Biological Sciences. It summarizes the issues involved in the controversy, as viewed by science teachers.

The teaching of health and the establishment of health habits have been one of the cardinal objectives of education for many years. In 1942, the New York State Regents passed a regulation requiring the teaching of health in the high schools of the state. Bulletin 1371, *The Health Teaching Syllabus for the Junior and Senior High Schools,* was "designed to present the material for the basic course work in health required by the Regents."

In 1950, the New York State Legislature passed a law which adversely affects the teaching of health in the schools of the state. Under this law, "subject to rules and regulations of the Board of Regents, a pupil may be excused from such study of health and hygiene as conflicts with the religion of his parents or

guardian." The amendment was specifically sought by the Christian Science Church.

Dr. Lewis A. Wilson, Commissioner of Education, has already approved the exemption of the children of parents or guardians of the Christian Science faith from instruction in the units of disease prevention and control and has indicated specifically which parts of the syllabus are to be omitted in their case. According to his ruling, these children will get no instruction in such areas as the building up of resistance to disease; the understanding of current health programs, both public and private; measures used to prevent the spread of communicable diseases; the importance of heart disease, cancer, diabetes, diphtheria, typhoid fever, tuberculosis, and infantile paralysis; the role of insects in the transmission of disease, a role which properly understood enabled the United States to build the Panama Canal after France had failed; the relation of the sanitary control of water and food to public health; war conditions and the problem of disease control and prevention; what bacteria are; the work of such eminent figures as Florence Nightingale, Louis Pasteur, Walter Reed, Robert Koch, and Alexander Fleming, the discoverer of penicillin; the home care of the sick; first-aid treatment; and so on. This is only a sampling of the units of instruction that fall under the ban of law.

It is obvious from the mere listing of these topics that the law will deprive exempted children of invaluable information; but even more, the Commissioner goes on to state that "required sections of the Regents examination as well as the State Scholarship examinations will be constructed so as not to penalize pupils who have been excused from instruction in the specified units of study." Thus, de-emphasis and virtual elimination of these topics loom up for all children, Christian Science or not. Even on a history examination, for example, no question may be asked about Louis Pasteur or Gen. William Gorgas, for these men were concerned with disease control.

This law and its method of implementation are so alarming from the point of view of the protection of the health of the individual and the community and from the point of view of the preservation of the state itself and its public educational system, that a widespread demand for its repeal is in order.

Lipoid-Lipoprotein Cholesterol

THE ultracentrifuge studies of J. W. Gofman and co-workers on lipoid-lipoprotein cholesterol complexes in sera have established the importance of the differences in the physical state, especially particle size, in atherosclerosis. We have observed an even more striking similar effect while producing experimental hypercholesteremia in rabbits. In these animals a definite and consistent layering of the hyperlipemic and cholesteremic sera occurs merely on standing. Two definite layers form without centrifuging, similar to cream in a bottle of milk. This process is accentuated and quickened by an ordinary centrifuge. The upper layer consists of large aggregates which may be seen easily with an ordinary microscope. The effect occurs only when high serum levels are attained, especially over 1,500 mg% of cholesterol; and the height of the layer increases roughly in proportion as the cholesterol level is raised by continued feeding. There is a marked difference in the cholesterol content of the two layers. In one serum the top layer contained 4,540 mg% of total cholesterol and 1,100 mg% of free cholesterol, whereas the bottom layer had 2,020 mg% total and 616 mg% of free cholesterol.

This very easily elicited difference in lipoid aggregates probably plays an important role in the experimental production of atheroma in the rabbit. The study of these layers should aid in determining the exact nature of the lipo-protein-cholesterol complexes.

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A Correction to North American Fauna No. 35

IT WAS recently suggested to the writer by Elliott S. Barker, State Game Warden of New Mexico, that the figures given by the late Vernon Bailey in "Life Zones and Crop Zones of New Mexico" (*North American Fauna No. 35* [1913]) for some of the life zones of New Mexico seemed to him to be seriously in error. Since Bailey's paper and its accompanying map are still in rather wide use, at least by students of faunistics, and since the areas of the life zones are of importance in certain phases of game management, we decided to check Bailey's map carefully to recompute the areas. We assumed the map to be reasonably accurate. It is, apparently, the only detailed map of the life zones of New Mexico in existence.

E. S. Barker, Richard Allgood, and Levon Lee together carefully checked a copy of this map, using a planimeter for all zones except the combined Hudsonian–Arctic–Alpine, which they estimated. The writer made an independent estimate from another copy of the map, by taking each township separately and estimating visually to the nearest 25% the proportion of the township in each of the several life zones. (There are approximately 3,400 townships in New Mexico, the area of the state being about 122,400

TABLE 1

Zone	Bailey (round figures, sq mi)	Barker (round figures, sq mi)	Campbell (actual figures, sq mi)
Lower Sonoran	18,000	19,400	19,516
Upper Sonoran	92,000	79,000	78,482
Transition	10,000	20,000	19,242
Canadian	2,000	3,850	4,167
Hudsonian	300	150	234
Arctic-Alpine	100		
Totals	122,400	122,400	121,641